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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,183	09/24/2003	Mehrdad Nikoonahad	5589-02326 P688-04C	9132
35617	7590	08/24/2004	EXAMINER	
CONLEY ROSE, P.C. P.O. BOX 684908 AUSTIN, TX 78768			WASHBURN, DOUGLAS N	
			ART UNIT	PAPER NUMBER
			2863	

DATE MAILED: 08/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/670,183

Applicant(s)

NIKOONAHAD ET AL.

Examiner

Douglas N Washburn

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 6633-6652 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6633-6651 is/are rejected.
- 7) ☒ Claim(s) 6652 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>1/16/04 &amp; 3/16/04</u>   | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1 The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –  
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 6633 and 6635-6651 rejected under 35 U.S.C. 102(b) as being anticipated by Aspnes et al. (US 5,900,939) (Hereafter referred to as Aspnes).

Aspnes teaches:

A spectroscopic ellipsometer configured to generate one or more output signals during measurement of a specimen in regard to claim 6633

(e.g.; column 3, lines 45-50; figure 1, element 18);

A processor coupled to a spectroscopic ellipsometer and configured to determine a critical dimension and a thin film characteristic of a specimen from one or more output signals in regard to claim 6633

(e.g.; column 4, lines 26-27; figure 1, element 48);

A system is integrated into a process tool in regard to claim 6635

(e.g.; column 3, lines 45-50; figure 1);

A spectroscopic ellipsometer is configured to illuminate a specimen at an oblique angle of incidence in regard to claim 6636

(e.g.; column 5, lines 49-52; figure 1);

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A spectroscopic ellipsometer is configured to illuminate a specimen at an oblique angle of incidence with a light beam comprising visible and ultraviolet light in regard to claim 6637

(e.g.; column 3, lines 51-55; column 5, lines 32-34; figure 1);

A spectroscopic ellipsometer is configured to illuminate a specimen at a normal angle of incidence in regard to claim 6638

(e.g.; figure 1, elements, 20 and 30);

A spectroscopic ellipsometer is configured to illuminate a specimen at a normal angle of incidence with linearly polarized light in regard to claim 6639

(e.g.; column 6, lines 41-51; figure 1);

A spectroscopic ellipsometer is configured to illuminate a specimen at a normal angle of incidence with polarized light in regard to claim 6640

(e.g.; column 3, lines 55-63; figure 1);

A spectroscopic ellipsometer is configured to illuminate a specimen at a normal angle of incidence with polarized, visible light in regard to claim 6641

(e.g.; column 3, lines 55-63; figure 1);

A spectroscopic ellipsometer is configured to focus light to a small spot on a specimen in regard to claim 6642

(e.g.; column 5, lines 11-13; figure 1);

A processor is configured to use a thin film characteristic to determine a critical dimension in regard to claim 6643

(e.g.; column 4, lines 58-62; figure 1, element 48);

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A system is coupled to a stand-alone metrology or inspection system, and the systems are configured such that signals may be sent between the systems in regard to claim 6644

(e.g.; column 3, lines 40-44; figure 1);

A thin film characteristic comprises optical properties of one or more layers on a specimen in regard to claim 6645

(e.g.; column 8, lines 24-28; figure 1);

A critical dimension comprises a lateral dimension of a feature on a specimen defined in a direction substantially parallel to an upper surface of a specimen, a lateral dimension of a feature defined in a direction substantially perpendicular to the upper surface of a specimen, or a sidewall angle of a feature in regard to claim 6646

(e.g.; figure 8);

A specimen comprises a wafer in regard to claim 6647

(e.g.; column 6, lines 61-64; figure 1, element 4);

A specimen comprises a substrate suitable for fabrication of a reticle in regard to claim 6648

(e.g.; column 6, lines 62-65; figure 1, element 4);

A spectroscopic ellipsometer configured to generate one or more output signals during measurement of a wafer is integrated into a lithography track in regard to claim 6649

(e.g.; column 3, lines 45-50; figure 1, element 18);

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A processor coupled to a spectroscopic ellipsometer and configured to determine a critical dimension and a thin film characteristic of a wafer from one or more output signals in regard to claim 6649

(e.g.; column 4, lines 58-62; figure 1, element 48);

A spectroscopic ellipsometer is configured to illuminate a specimen at an oblique angle of incidence with a light beam comprising visible and ultraviolet light in regard to claim 6650

(e.g.; column 3, lines 51-55; column 5, lines 32-34; figure 1);

And a spectroscopic ellipsometer is configured to illuminate a specimen at a normal angle of incidence with polarized, visible light in regard to claim 6651

(e.g.; column 6, lines 41-51; figure 1).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –  
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or  
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 6634 is rejected under 35 U.S.C. 102(e) as being anticipated by Stanke et al. (US 6,563,586) (Hereafter referred to as Stanke).

Stanke teaches:

A spectroscopic ellipsometer configured to generate one or more output signals during measurement of a specimen in regard to claim 6633

(e.g.; column 9, lines 32-34);

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A processor coupled to a spectroscopic ellipsometer and configured to determine a critical dimension and a thin film characteristic of a specimen from one or more output signals in regard to claim 6633

(e.g.; column 13, lines 7-14);

And a system is configured as a stand-alone device in regard to claim 6634

(e.g.; column 3, lines 55-58).

### ***Allowable Subject Matter***

2 Claim 6652 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Response to Arguments***

3 Applicant's arguments filed 16 July 2004 have been fully considered but they are not persuasive.

Applicant argues "A critical dimension may include a lateral dimension of a feature defined in a direction substantially parallel to an upper surface of the specimen such as width 62 of feature 56 on specimen 60. Therefore, a critical dimension may be generally defined as a lateral dimension of a feature when viewed in cross section such as a width of a gate or interconnect or a diameter of a hole or via. A critical dimension of a feature may also include a lateral dimension of a feature defined in a direction substantially perpendicular to an upper surface of the specimen such as height 64 of feature 56 on specimen 60. (Specification - page 74, lines 17-23.)". Therefore, a **"critical dimension" as defined in the Specification does not include a thickness of a film. In contrast the Specification states that "Examples of thin film characteristics**

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**include, but art not limited to, a thickness, an index of refraction and an extinction coefficient."** (Specification - page 250. lines 1 1-12.) Therefore a film thickness is defined in the Specification as a thin film characteristic, as presently claimed."

However, in the applicant's specification Detail Description Paragraph - DETX (364):

[0517] In an embodiment, each of the systems, as described herein, may be used to reduce, and even to minimize, within wafer ("WIW") variability of critical metrics of a process such as a lithography process. For example, critical metrics of a lithography process may include a property such as, but are not limited to, critical dimensions of features formed by the lithography process and overlay misregistration. **Critical metrics of a process, however, may also include any of the properties as described herein including, but not limited to, a presence of defects on the specimen, a thin film characteristic of the specimen, a flatness measurement of the specimen, an implant characteristic of the specimen, an adhesion characteristic of the specimen, a concentration of an elements in the specimen.** Such systems, as described herein, may be configured to determine at least one property of a specimen at more than one position on the specimen. For example, the measurement device may be configured to measure at least the one property of the specimen at multiple positions within a field and/or at multiple positions within at least two fields on the specimen. The measured property may be sent to a processor, or a within wafer film processor. The processor may be coupled to the measurement device and may be configured as described herein.



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The previous excerpt of the applicant's specification appears to contradict the applicant's argument that a critical dimension as defined in the Specification does not include a thickness of a film. Therefore the §102(b) rejection of claims 6633 and 6635-6651, the §102(e) rejection of claim 6634 and the objection to claim 6652 stands.

### ***Conclusion***

4 **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas N Washburn whose telephone number is (571) 272-2284. The examiner can normally be reached on Monday through Thursday 6:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DNW



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